

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Refer to all sections of the specification for related work.

1.2 REFERENCES

- .1 Treasury Board of Canada Secretariat (TBS), Occupational Safety and Health (OSH)
 - .1 Fire Protection Standard-[10].
- .2 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S524-06, Standard for the Installation of Fire Alarm Systems.
 - .2 CAN/ULC-S526-07, Visible Signal Devices for Fire Alarm Systems, Including Accessories.
 - .3 CAN/ULC-S527-99, Standard for Control Units for Fire Alarm Systems.
 - .4 CAN/ULC-S528-05, Manual Stations for Fire Alarm Systems, Including Accessories.
 - .5 CAN/ULC-S529-09, Smoke Detectors for Fire Alarm Systems.
 - .6 CAN/ULC-S530-91(R1999), Heat Actuated Fire Detectors for Fire Alarm Systems.
 - .7 CAN/ULC-S531-02, Standard for Smoke Alarms.
 - .8 CAN/ULC-S537-04, Standard for the Verification of Fire Alarm Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for fire alarm system devices and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Manitoba Canada.
 - .2 Indicate on shop drawings:
 - .1 Detail assembly and wiring diagrams
 - .2 Details for devices.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for fire alarm system for incorporation into manual.
- .3 Include:

- .1 Technical data - illustrated parts lists with parts catalogue numbers.
- .2 Copy of approved shop drawings with corrections completed and marks removed except review stamps.
- .3 List of recommended spare parts for system.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESCRIPTION

- .1 System to include:
 - .1 Initiating/input circuits.
 - .2 Output circuits.
 - .3 Auxiliary circuits.
 - .4 Wiring.
 - .5 Manual and automatic initiating devices.
 - .6 Audible and visual signalling devices.
 - .7 End-of-line resistors.
- .2 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .3 Audible signal devices: to CAN/ULC-S524.
- .4 Visual signal devices: to CAN/ULC-S526.
- .5 Manual pull stations: to CAN/ULC-S528.
- .6 Thermal detectors: to CAN/ULC-S530.
- .7 Smoke detectors: to CAN/ULC-S529.
- .8 Smoke alarms: to CAN/ULC-S531.
- .9 Regulatory Requirements:

- .1 To TBS Fire Protection Standard.
- .2 Subject to Fire Commissioner of Canada (FC) approval.
- .3 Subject to FC inspection for final acceptance.
- .4 To Canadian Forces Fire Marshal approval.
- .5 System components: listed by ULC and comply with applicable provisions of NBC, Local, Provincial Building Code and meet requirements of local authority having jurisdiction.

2.2 SYSTEM OPERATION: TWO STAGE - SIGNALS ONLY

- .1 Actuation of any alarm initiating device on first stage to:
 - .1 Cause electronic latch to lock-in alarm state at central control unit and data gathering panel/transponder.
 - .2 Indicate zone of alarm at central control unit and at remote annunciator display.
 - .3 For low rise buildings:
 - .1 Cause audible devices throughout building to sound at 20 strokes per minute.
 - .2 Cause audible devices in zone of alarm to sound continuously while other audible devices throughout building sound at 20 strokes per minute.
- .2 Actuation of any alarm initiating device on second stage to:
 - .1 Cause audible signalling devices to sound in alarm tone throughout building.
- .3 If first stage alarm is not acknowledged within 5 minutes, ensure system automatically goes into second stage.
- .4 Acknowledging alarm: indicated at central control unit.
- .5 Ensure that it is possible to silence signals by "alarm silence" switch at central control unit, after 60 seconds period of operation.
- .6 Subsequent alarm, received after previous alarm has been silenced, to re-activate signals.
- .7 Actuation of any supervisory device to:
 - .1 Cause electronic latch to lock-in supervisory state at central control unit and data gathering panel/transponder.
 - .2 Indicate respective supervisory zone at central control unit and remote annunciator display.
 - .3 Cause audible signal at central control unit to sound.
 - .4 Activate common supervisory sequence.
- .8 Trouble on system to:
 - .1 Indicate circuit in trouble at central control unit.
 - .2 Activate "system trouble" indication, buzzer and common trouble sequence. Acknowledging trouble condition to silence audible indication; visual indication to remain until trouble is cleared and system is back to normal.
- .9 Troubles on system: suppressed during course of alarm.

- .10 Trouble condition on any circuit in system not to initiate alarm conditions.

2.3 CONTROL PANEL (Existing)

2.4 INITIATING/INPUT CIRCUITS (to match existing)

2.5 AUXILIARY CIRCUITS (to match existing)

2.6 WIRING

- .1 Twisted copper conductors: rated 300V.
- .2 To initiating circuits: 18 AWG minimum, and in accordance with manufacturer's requirements.
- .3 To signal circuits: 16 AWG minimum, and in accordance with manufacturer's requirements.
- .4 To control circuits: 14 AWG minimum, and in accordance with manufacturer's requirements.

2.7 MANUAL ALARM STATIONS

- .1 Manual alarm stations: pull lever, wall mounted semi-flush or surface type, and general alarm key switch for two stage system bilingual English French signage.

2.8 AUTOMATIC ALARM INITIATING DEVICES

- .1 Heat detectors, fixed temperature, non- restorable, rated 57 degrees C.
- .2 Thermal fire detectors, combination fixed temperature and rate of rise, non-restorable fixed temperature element, self-restoring rate of rise, fixed temperature 57 degrees C, rate of rise 8.3 degrees C per minute.
- .3 Smoke detector: ionization type air duct type with sampling tubes with protective housing.
 - .1 Twistlock Plug-in type with fixed base.
 - .2 Wire-in base assembly with integral red alarm LED, and terminals for remote relay alarm LED.
- .4 Addressable smoke detector.
 - .1 Ionization type.
 - .2 Electronics to communicate detector's status to addressable module/transponder.
 - .3 Detector address to be set on detector base head in field.

2.9 AUDIBLE SIGNAL DEVICES

- .1 Bells: surface mounted, single stroke, polarized, 24 V dc, 150 mm, 98db.
- .2 Bells: to match existing type, gongs of special alloy steel, 24 V dc, 150mm, 98db.

2.10 VISUAL ALARM SIGNAL DEVICES

- .1 Strobe type: to match existing, red, 24 V dc.

- .2 Designed for surface mounting on walls

2.11 END-OF-LINE DEVICES

- .1 End-of-line devices to control supervisory current in alarm circuits and signalling circuits, sized to ensure correct supervisory current for each circuit. Open short or ground fault in any circuit will alter supervisory current in that circuit, producing audible and visible alarm at main control panel and remotely.

2.12 AS-BUILT RISER DIAGRAM

- .1 Provide Fire alarm system riser diagram for the renovation area

2.13 ANCILLARY DEVICES

- .1 Remote relay unit to initiate fan shutdown.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for fire alarm installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Install systems in accordance with CAN/ULC-S524.
- .2 Install manual alarm stations and connect to alarm circuit wiring.
- .3 Locate and install detectors and connect to alarm circuit wiring. Mount detectors more than 1 m from air outlets. Maintain at least 600 mm radius clear space on ceiling, below and around detectors. Locate duct type detectors in straight portions of ducts.
- .4 Connect alarm circuits to main control panel.
- .5 Install signal bells and visual signal devices and connect to signalling circuits.
- .6 Connect signalling circuits to main control panel.
- .7 Install end-of-line devices at end of alarm and signalling circuits.
- .8 Install remote relay units to control fan shut down.
- .9 Sprinkler system: wire alarm and supervisory switches and connect to control panel.
- .10 Room detection system.

- .1 Install detectors. Make necessary connections between room detection panel and main fire alarm panel.
- .2 Locate and install audible signals, visual alarms.
- .11 Splices are not permitted.
- .12 Provide necessary raceways, cable and wiring to make interconnections to terminal boxes, annunciator equipment and CCU, as required by equipment manufacturer.
- .13 Ensure that wiring is free of opens, shorts or grounds, before system testing and handing over.
- .14 Identify circuits and other related wiring at central control unit, annunciators, and terminal boxes.

3.3 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical and CAN/ULC-S537.
- .2 Fire alarm system:
 - .1 Test such device and alarm circuit to ensure manual stations, thermal, smoke detectors, sprinkler system transmit alarm to control panel and actuate first stage alarm general alarm ancillary devices.
 - .2 Check annunciator panels to ensure zones are shown correctly.
 - .3 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of systems.
 - .4 Addressable circuits system style DCLA:
 - .1 Test each conductor on all DCLA addressable links for capability of providing 3 or more subsequent alarm signals on each side of single open-circuit fault condition imposed near midmost point of each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.
 - .2 Test each conductor on all DCLA addressable links for capability of providing 3 or more subsequent alarm signals during ground-fault condition imposed near midmost point of each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.
 - .5 Addressable circuits system style DCLB:
 - .1 Test each conductor on all DCLB addressable links for capability of providing 3 or more subsequent alarm signals on line side of single open-circuit fault condition imposed near electrically most remote device on each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.
 - .2 Test each conductor on all DCLB addressable links for capability of providing 3 or more subsequent alarm signals during ground-fault condition imposed near electrically most remote device on each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.

- .3 Provide final PROM program re-burn for system Departmental Representative incorporating program changes made during construction.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by fire alarm system installation.

3.6 CLOSEOUT ACTIVITIES

- .1 Provide on-site lectures and demonstration by fire alarm equipment manufacturer to train operational personnel in use and maintenance of fire alarm system.

END OF SECTION